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## ABSTRACT

This invention relates to a practical superconducting conductor based upon biaxially textured high temperature superconducting coatings. In particular, methods for producing flexible and bend strain-resistant articles and articles produced in accordance therewith are described which provide improved current sharing, lower hysteretic losses under alternating current conditions, enhanced electrical and thermal stability and improved mechanical properties between otherwise isolated films in a coated high temperature superconducting (HTS) wire. Multilayered materials including operational material which is sensitive to bend strain can be constructed, in which the bend strain in the region in which such operational material is located is minimized. The invention also provides a means for splicing coated tape segments and for termination of coated tape stack ups or conductor elements.

In one embodiment, a multi-layer high temperature superconductor is provided and includes first and second high temperature superconductor coated elements. Each element includes a substrate, at least one buffer deposited on the substrate, a high temperature superconductor layer, and a cap layer. The first and second high temperature superconductor coated elements are joined at the first and second cap layers.

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